

WHAT IS CLAIMED IS:

1. A process for preparing superabsorbent structures comprising:
- (a) preparing a high internal phase water-in oil emulsion comprising, in its aqueous dispersed phase, at least one hydrophilic monomer in aqueous solution and an
5 initiator,
- (b) polymerizing the monomer in the aqueous dispersed phase to form a precursor polymer,
- (c) mixing the water-in-oil emulsion containing the precursor polymer with a post crosslinker and, optionally a plasticizing agent,
- 10 (d) applying the emulsion resulting from step (c) onto a support material,
- (e) allowing or inducing coalescence of the aqueous phase under conditions sufficient to allow the emulsion to form a homogeneous polymer gel structure, and
- (f) drying and post crosslinking the formed gel material at a temperature sufficient to dry and cure the material, and
- 15 (g) optionally, post-treating the material obtained in step (f) by post-heat treating the material, by surface modifying the material, by surface post-crosslinking the material, or by any combination of these post-treatments.
2. The process of Claim 1 wherein: an inversion agent is employed in step (c); and step (d) comprises spreading or casting.
- 20 3. A process according to Claims 1 or 2 wherein the inversion of the emulsion can be accomplished by 1) solvent extraction, 2) evaporation of the organic phase, 3) application of surfactant(s) having a high hydrophilic lipophilic balance (HLB), 4) application of low critical solution temperature solvents, or 5) application of metal oxide powders.
- 25 4. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by solvent extraction.
5. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by evaporation of the organic phase.
6. A process according to Claim 3 wherein the inversion of the emulsion is
30 accomplished by the application of at least one surfactant having a high hydrophilic lipophilic balance (HLB).
7. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one low critical solution temperature (solvent).
8. A process according to Claim 3 wherein the inversion of the emulsion is
35 accomplished by the application of at least one metal oxide powder.

9. A film prepared by the process of Claims 1 or 2.

10. An absorbent article which comprises a superabsorbent polymer film or pattern prepared from a high internal phase polyelectrolyte prepared by the process of Claims 1 or 2.

5 11. A high internal phase polyelectrolyte emulsion which useful for the manufacture of a superabsorbent polymer having a weight average molecular weight of at least 1,500,000, the emulsion having two phases: i) a continuous oil phase and ii) a dispersed aqueous phase containing polyelectrolyte, wherein the dispersed aqueous phase contains a concentration of polyelectrolyte which is from 10 to 50 percent based on the total
10 aqueous phase.

12. An emulsion according to Claim 11 wherein the oil phase is a hydrophobic organic solvent.